US Army Corps of Engineers®

R&D Program: TOWNS

Work Unit: Geophysical Modeling for Anomalous Seepage Assessment and Long

Needs & Problems Addressed:

- Corps flood control and water retention structures designed to seep
- Changes in seepage may indicate need for maintenance or response to avoid levee failure
- Need quantitative and non-intrusive method to monitor seepage

Objectives:

- Provide direct, near real-time, and site-specific information about seepage direction

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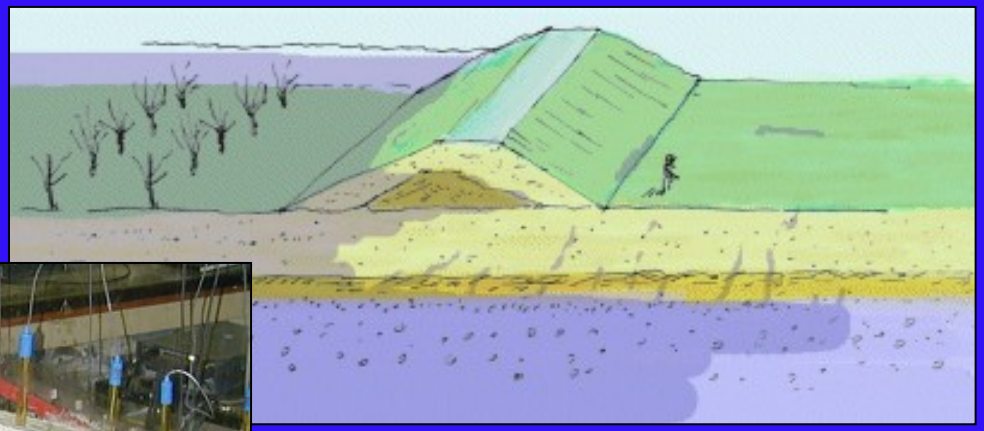
Work Unit: Geophysical Modeling for Anomalous Seepage Assessment and Long-Term Monitoring

Work Unit Funding Profile:

FY03	FY04	FY05	Total
$250k	$250k	$225k	$725k



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Business Program/Missions Areas Supported:

- Inland Navigation __ %
- Coastal Navigation __ %
- Coastal Storm Damage Reduction 20 %
- Inland Flood Control/Damage Reduction 50 %
- Environmental Protection & Quality __ %
- Multi-Purpose (Hydropower, Rec & Water Supply) 10 %
- Emergency Management 20 %
- Regulatory __ %
- Support for Others __ %

(Must to add to 100%) Total: 100 %

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CW Strategic Goals Check List: (check if applies)

- Provide sustainable water resources development & mgmt _X_
- Restore past environment degradation ___
- Provide project services of high quality _X_
- Reduce losses from natural & manmade hazards _X_
- Supports being a world class technical leader _X_
- Addresses strategic or system needs in a framework or integrated approach by developing:
  - Methods or decision support tools _X_
  - Technology to improve life cycle productivity _X_
  - Technology to monitor systems, provide feedback and develop operating guidance ___

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Which “short term” field needs does this support:

- Improves efficiencies in operations and maintenance of Corps structures
- Improves functional performance during flood fighting
- Enhances service life of projects by detecting changes with seepage
- Expedites decision-making during flood-fights
- Increases public safety
- Reduces life-cycle costs by detecting maintenance needs early

Field Review Group Relative Ranking:

- FRG planned for 21-22 AUG 02

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Listening Sessions Check List: (check if applies)

- Improves data sharing/exchange with the public in these areas:
  - Provides one stop shop for maps & data for basin wide planning ___
  - Provides data to make informed decisions _X_
  - Provides a system for basin wide planning ___
  - Provides information about what is happening at Corps facilities _X_ (up to date web sites)
- Tech Transfer plan to include educating the public X
- Coordinate research, models, analysis with regulatory agencies to insure results will be accepted _X_
- Develop R&D products:
  - For watershed management plans, not just at the project level ___
  - To include aesthetics as components of all projects ___
- Create better models for ground & surface water ___

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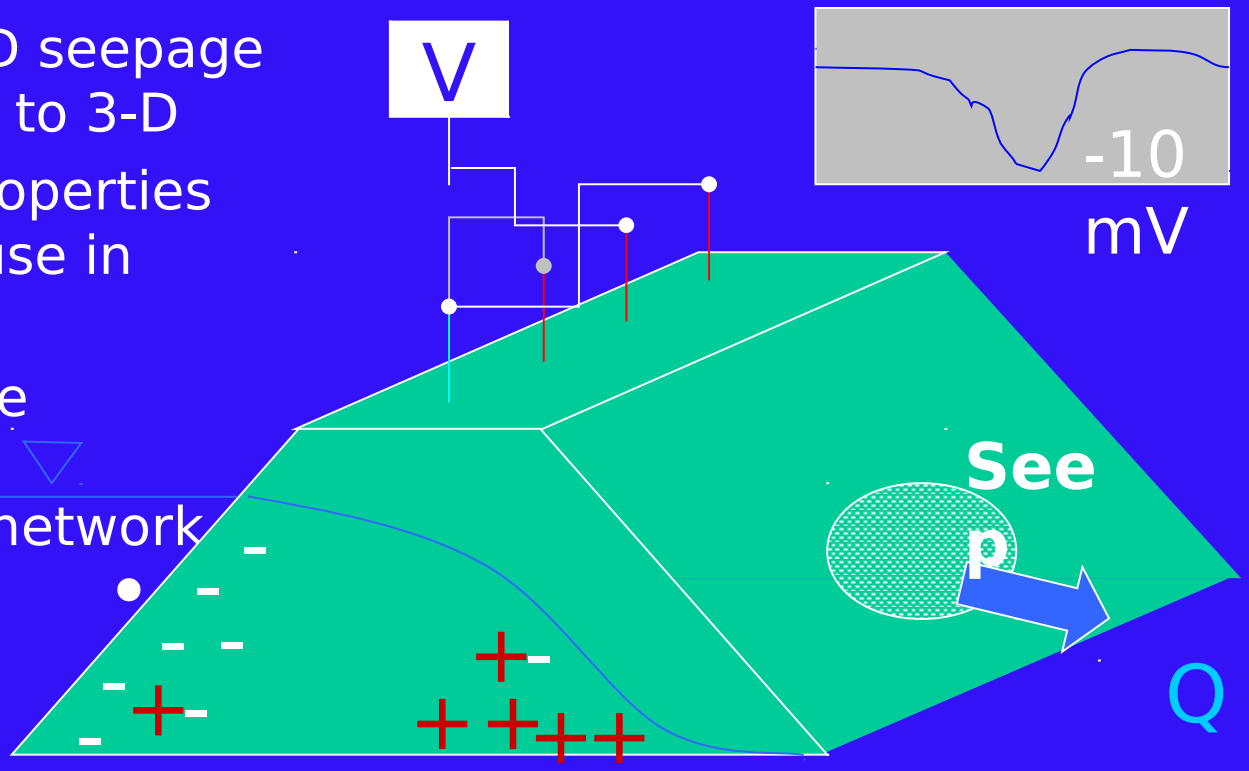
Products:

- Enhance 2-D seepage model SPPC to 3-D
- Build Soil Properties Library for use in SPPC
- Demonstrate automated monitoring network



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Benefits

- Direct:
  - Focused on providing quantitative non-intrusive method to detect seepage rates
  - ROI due to cost avoidance provided by detection of conditions for levee failures
- Indirect:
  - Provides fundamental knowledge for maintenance of Corps structures
  - Provides risk reduction for public through early detection of seepage changes
  - Enhances O$M and EM capabilities
  - Coordinated with international DAM Safety Interest Group

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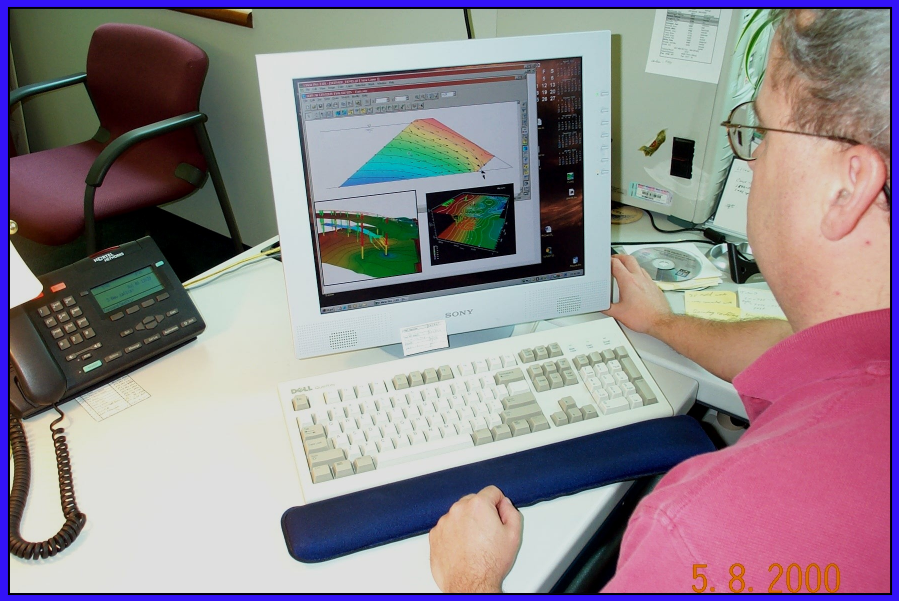
Technology Transfer Plan:

- Software combining SP monitoring tool, 3-D model, and Soil Properties Library
- Guidance document to share function and applicability of SP tool and software
- Report documenting results of field demonstrations of technique
- Documentation of automated long term monitoring system



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Why should the Corps fund this R&D, instead of private industry and/or others:

- Little incentive for private industry to develop methods to monitor dam and levee seepage since most are federal, state, or local government property

What is Impact if not started:

- Potential failure of levees or dam
- Higher O&M costs when damage detected only after large changes in seepage
- Less effective emergency operations